HIGHLAND
PRODUCTS GROUP LLC

GENERAL SPECIFICATION

MANUFACTURER'S QUALIFICATIONS

Highland maintains at all times a quality control program as herein outlines so as to insure that all precast meets all requirements as specified under physical requirements. All precast shall be manufactured by skilled workmen who have at least five years experience in similar work and supervised by foreman certified by the ACI (American Concrete Institute).

MANUFACTURING

All precast work shall be true to dimension and have clean, accurate arises and details faithfully executed. Reinforcing steel shall conform to work and shall have a minimum compressive strength of 5,000 psi at 28 days of age when tested by means of cylinder molds (6x12) from the materials. There shall be a maximum of 4-6% air entertainment for all precast according to ASTM standards.

REINFORCEMENT

All concrete products have reinforcement characteristics such as rebar or fiberglass.

MOLDS

The forms for the precast units shall be constructed of metal or fiberglass laminated designed to withstand casting pressures without distortion. All anchors, inserts, bolts, etc. will be placed and secured in the forms as required for the attachment and handling of the units. These shall be clamped so as to hold them in position during fabrication.

PHYSICAL CHARACTERISTICS

All exposed surfaces are treated to remove the surface matrix and exposed the aggregate produced by chemical retardant – not sand blasting. All precast shall have the water-repellent sealer treatment applied in strict accordance with manufacturer's specifications. All tolerances shall be within 1/8" of specified dimensions, designed for structural analysis and calculation.

COLOR

Color to be uniform throughout as approved by owner or specifier in accordance with manufacturer's recommendation.

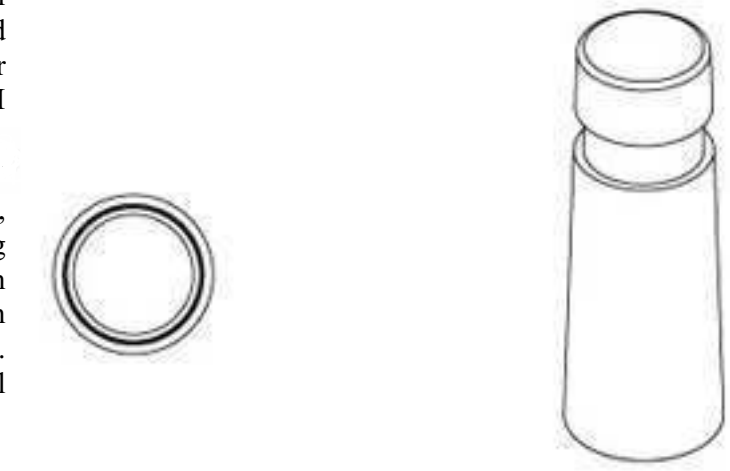
MATERIALS

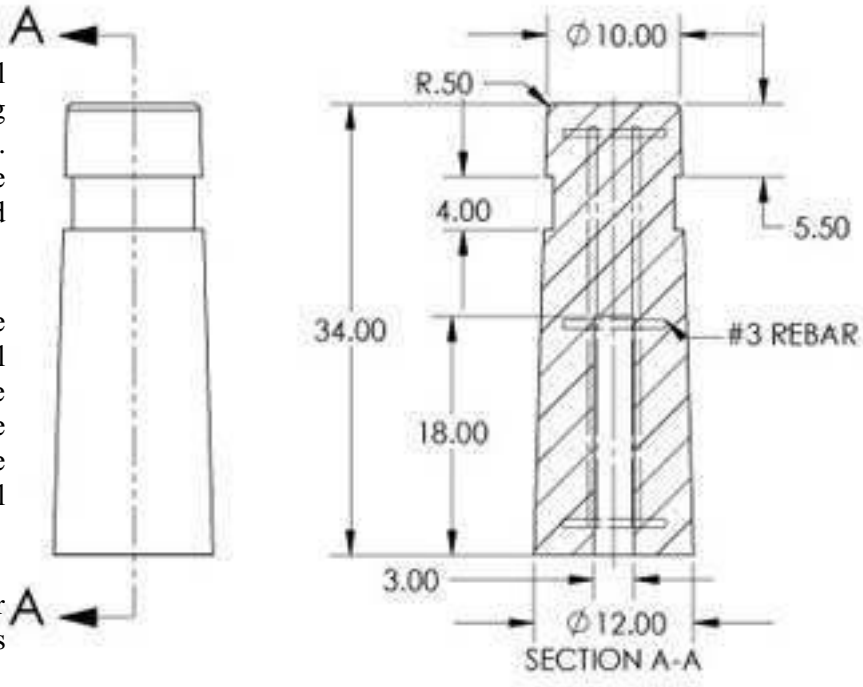
Portland Cement: ASTM C150 Type 1 or 3
All aggregate to meet ASTM C33 Specifications

REQUIRED MATERIALS FOR APPROVAL

A. Shop drawings with dimensions, general contraction component parts, anchoring details and installation.
B. Samples upon request of architects.
C. Complete dates on manufacturer's and technical information.

Weight: 240 LBS





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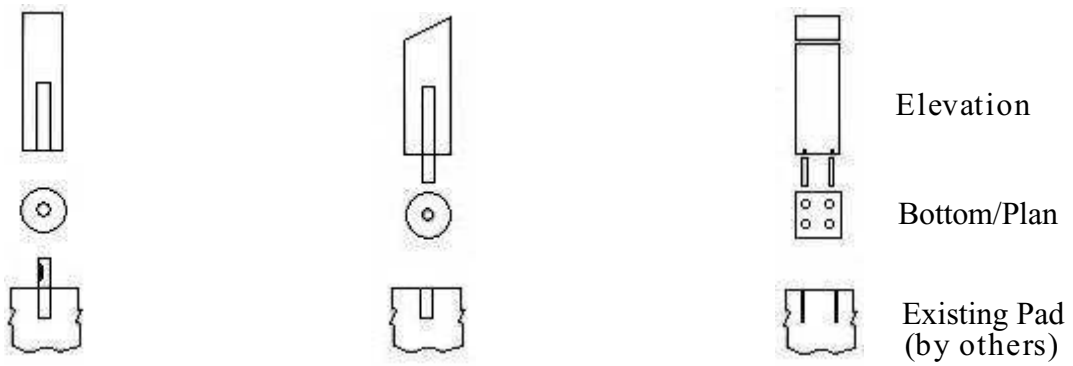
PRODUCT SPECIFICATIONS

Mounting Options
Bollard Anchoring Options

Option A
(any model bollard)

Option B
(any model bollard)

Option C
(any model bollard)



Note:
Option C is the most widely used method of anchoring bollards.

Option A:
Bollard is precast with hollow core. Dimensions of this core are pre-determined by the contractor, and need to be specified when placing order. Existing pad, slab, or sidewalk is cast with exposed vertical tubing or pipe to fit inside the core of bollard. Before bollard is set on exposed tube on the existing pad, epoxy, caulk, or other bonding agent is applied to core and/or vertical pipe for securing purposes. The bollard is then set in place.

Option B:
Bollard is precast with pipe or tube protruding from bottom of bollard. Dimensions of protruding pipe or tube are pre-determined by the contractor, and need to be specified when placing order. Existing pad, slab, or sidewalk is cast with sleeve correlating to protruding pipe on bottom of bollard. Before bollard is set, epoxy, caulk, or other bonding agent is applied to either the tube or pipe, and/or applied into the sleeves into the sleeves in the existing pad. The bollard is then set in place.

Option C:
Bollard is precast with a predetermined number and pattern of inserts into the bottom of the bollard. Size and pattern of inserts are determined by the contractor, and need to be specified when placing order. The existing pad, slab, or sidewalk is cast with sleeves correlating to the inserts in the bottom of the bollard. Threaded rod (included with purchase of bollard) is then screwed into the inserts in the bottom of the bollard. Epoxy, caulk, or other bonding agent is applied to the rod and/or into the sleeves in the existing pad, and the bollard is set in place.

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Finish Options

Smooth Finishes (For Precast Concrete or GFRC)

Lt. Sand Blasted (For Precast Concrete or GFRC)

Exposed Aggregate for Precast Concrete

Dura Brite

Thermoplastic Colors

Etched

Perma

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